International Preliminary Examining Report of Nov. 7, 2003

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1. This internal preliminary examining report is issued by the Office assigned therewith and is forwarded to the applicant in accordance with Article 36.

2. This report comprises all told 4 pages including the cover page.

Moreover. The report is accompanied by ENCLOSURES; these are pages with specification, claims and/or drawings which were altered and are the basis of this report, and/or pages with amendments made before this authority (see Rule 70.16 and Section 607 of the Guidelines for PCT)

These enclosures comprise all told 2 pages.

I X Basis of the report

V X Reasoned opinion according to Rule 66.2a)ii) regarding novelty, inventive step and commercial applicability: documents and explanation in support thereof

I. Basis of the Report

1.This report was drawn up on the basis (replacement pages filed upon request by the Office according to Article 14 shall be considered within the scope of this report as "originally filed" and are not attached, because they do not contain any changes (Rules 70.16 and 70.17)):

Specification, Pages:

1-14 original version

Claims, Nos.:

1-7 submitted with the request for examination

Drawings, pages:

1/3-3/3 original version

V. Reasoned opinion according to Article 35(2) regarding novelty, inventive step and commercial applicability; documents and explanation in support thereof

1. Opinion

Novelty (N) Yes: Claims 1-7

Inventive step (IS) Yes: Claims 1-7

Commercial applicability (CA) Yes: Claims 1-7

2. Documents and Explanations

see accompanying page

INTERNATIONAL PRELIMINARY EXAMINATION REPORT
ACCOMPANYING PAGE

<u>To point V</u>

Reasoned opinion according to Article 35(2) regarding novelty, inventive step and commercial applicability: documents and explanation in support thereof

Reference is made to the following documents:

D1: GB 549 140 A (EDWARD ERNEST SIMMONS JR) 9 November 1942 (1942-11-09)
D1: DE 36 36 252 A (HECK SIEGRIED) 5 May 1988 (1988-05-05) mentioned in the present application

1.1 A device for force measurement according to the generic part of claim 1 is known from the printed publication D1 (cf. in particular p.2, ll.71-p.3, l.24 and figs.2,3).

The device according to claim 1 differs from this closest prior art by the features of the characterizing part. Therefore, it fulfills the requirements of novelty (Art 33(1) and (2)PCT).

1.2 Theses differences solve the technical objects, (i) to reduce the influences of inertia forces and of local vibrations in quick tearing tests to reduce and (ii) to permit detection of bending forces.

1.3 Another state-of-the-art device for force measurement in quick tearing tests is known from D2. Although this device possesses a multiplicity of force sensors (9), they are applied in the direct vicinity of the second (back-rest side) connecting structure (3).

1.4 To someone skilled in the art, here is no indication to be found in the present state of the art to attach the force measuring sensors in the device according to D1 or D2 in the vicinity of the first sample side) connecting structure.

Therefore, the device according to claim 1 fulfills the requirement of inventive step (Art 33(1) and (3)PCT).

2. The dependent claims 2-7 relate to special embodiments of the device according to claim 1, and therefore also fulfill the requirements of Article 33 PCT.

What Is Claimed Is:

1. A device for force measurement in dynamic tensile experiments on material samples, comprising a force measuring cell, in which at least one force measuring sensor is integrated,
wherein said force measuring cell is executed one piece with a connecting structure, with the material sample being connectable in a firm, detachable manner via said connecting structure, and
said at least one force measuring sensor is disposed on said force measuring cell at a distance from said connecting structure.

2. The device according to claim 1,
wherein said connecting structure is a screw connection, having provided on said force measuring cell a thread contour into which a counter thread provided on the material sample is insertable in a firm, detachable manner.

3. The device according to claim 1,
wherein said connecting structure is a flange or bolt connection, and on the material sample a corresponding counter flange is provided, respectively a connecting contour corresponding to said bolt connection.

4. The device according to one of the claims 1 to 3,
wherein said force measuring cell is provided with a housing which has a thinner housing wall thickness in the region of said at least one force measuring sensor than in the other housing region.

5. The device according to claim 4,
wherein said housing is designed axially symmetrical to a axis of symmetry along which the tensile force acts on said force measuring cell via said material sample.

6. The device according to claim 5,
wherein two or a multiplicity of said force measuring sensors are applied on said housing in a symmetrical arrangement relative to said axis of symmetry.

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7. The device according to one of the claims 1 to 3,
wherein said force measuring cell is provided with two pressure plates which can be pressed against each other by means of firm, detachable pressure means,
said the tensile sample can be pressed between said pressure plates with force, and said at least one force measuring sensor is placed on said pressure plates at a distance from said pressure means.

8. The device according to one of the claims 1 to 7,
wherein said force measuring cell is provided with a second connecting structure, which is disposed opposite said first connecting structure and via which said force measuring cell is attachable to a fixed back-rest.

9. The device according to claim 8,
wherein said at least one force measuring sensor is disposed on said force measuring cell between said first and said second connecting structure at a distance to both said connection structures respectively.

10. The device according to claim 9,
wherein the distance between said at least one force measuring sensor and said first connecting structure, and thus between the former and the tensile sample, is smaller than the distance between said at least one force measuring sensor and said second connecting structure.

11. The device according to one of the claims 8 to 10,
wherein said force measuring cell has more a stable type of construction regarding elastic deformability in the region of said second connecting structure than in the region of said first connecting structure and said at least one force measuring sensor.

12. The device according to claim 1 to 11,
wherein said force measuring cell contains titanium.

Abstract

Disclosed is a device for force measurement in dynamic tensile experiments on material samples, comprising a force measuring cell, in which at least one force measuring sensor is integrated

The invention is distinguished by the force measuring cell being executed one piece with a connecting structure and with the material sample being connectable in a firm, detachable manner via the connecting structure, and
the at least one force measuring sensor being disposed on the force measuring cell at a distance from the connecting structure.